Photo Credit: Farmality

The Farmality team (Zainab, Khurram and Iram, left to right) and their solar dehydrating system

SOLAR-POWERED SUCCESS STORY: FARMALITY

The opportunity

Globally, millions of tonnes of food are wasted each year. Food wastage occurs due to a variety of factors including adverse weather, overproduction and improper storage. In Pakistan for example, **a staggering 40% of fruit and vegetables are wasted post-harvest** due to their short shelf-life and transport delays[1]. In hot countries where food is more susceptible to spoiling, the need for food preservation is vital.

Food drying is a viable solution to the problem, but many techniques can be labour-intensive, and open sun-drying methods have become obsolete. While it works well for certain seeds, fruits and vegetables, such as almonds, tomatoes, apricots, figs, and dates, it's unsuitable for other food items. Sun-drying causes food loss along with an increased risk of contamination from birds or insects. The quality of the end product can also be compromised by unpredictable weather.

Another form of food drying is the use of electrical dehydrators, although the relatively high cost makes this method out of reach for many.

Small-scale farmers in off- and weak-grid areas who want to enter the dried food market have a lack of options available to them, meaning less opportunity to increase their income[2].

According to research market analysts, the global dried food market is expected to reach $9.5 billion in 2025[3]. Considering these challenges and opportunities, a gap in the market became evident: the need to reduce food waste while developing a business that could offer small-scale farmers a diversification opportunity, and help meet the rapid demand for dried food products.

Farmality's dried food products

Efficiency for Access Design Challenge

The annual Efficiency for Access Design Challenge has provided a timely vehicle for these goals for an enterprising group of students in Pakistan. Partnering with universities around the world, the competition requires student teams to create affordable, innovative appliances to help accelerate clean energy access for those most in need.

A student team from the National University of Sciences and Technology (NUST) in Pakistan entered the Challenge in 2021, submitting the idea of a temperature-controlled, solar-powered dehydrating system, that could be operated in off-grid or remote areas where access to reliable electricity is limited. Operating independently of the main power grid, the system would enable food to be preserved without the need for costly and polluting diesel generators or other fossil fuel-based forms of power.

The team's design impressed judges and it scooped the Silver Award at the 2021-22 Efficiency for Access Design Challenge Grand Final. Following the award, Farmality was born.

Farmality's business kiosk

Benefitting from experts

Each team participating in the Challenge has access to a wealth of resources, including technical expertise and guidance from industry professionals, and is matched to an industry expert to mentor them through the process. The team that Farmality was a part of was paired with Nidhi Pant, Co-founder of S4S Technologies, winners of the EarthShot prize in 2023 for its solar-powered processing system to prevent food waste.

The students all agreed that taking part in the competition had benefits beyond the possibility of submitting a winning design.

Zainab Sajjad of Farmality says,

"We had the opportunity to combine our skills and develop a relatively simple idea to tackle a real-world, energy access problem. We learnt a lot from working as a team and the insight we gained from industry experts was invaluable, enabling us to apply our knowledge and creativity, and refine the effectiveness of the design throughout."

Learning from experts and starting a business enabled Farmality to pass some of its early experience on to others. For any young entrepreneurs considering building a business in the energy access space, and particularly young female entrepreneurs who are often under-represented, Iram Fatima has these words of advice,

"Build a strong support system of mentors, advisors, and like-minded individuals who can guide and inspire you along the way. Seek out communities, both online and offline, that foster collaboration, knowledge sharing, and empowerment."

Building a business

Farmality now has a fully operational solar-powered dryer which is being used by a farmer in Multan to produce culinary herbs, dried spices and dried fruits. The development of the dryer evolved from a prototype, made possible thanks to funding through the Low Energy Inclusive Appliances programme which is managed by Efficiency for Access.

The plan is to expand the business, and encourage more farmers to utilise its solar-powered dehydrators to establish an additional income stream before further scaling. Farmality has continued to promote awareness of its solar-powered appliance through its marketing efforts including showcasing at exhibitions in Pakistan and Dubai.

Zainab and Iram promoting their dried food products and services

Farmality's products and marketing materials

Summary

Due to the economic situation of Pakistan, building and replicating the product for a larger community of farmers has been difficult. However, as Iram acknowledged,

"We believe that access to clean energy for even one farmer at this stage to help improve his circumstances is enough to be recognised as a small advancement in clean energy access. We are motivated to keep working on empowering our farmers with clean technology."

Taking part in the Challenge opened up a wealth of networking and knowledge opportunities for Farmality and proved to be a valuable stepping stone into the world of energy access and the world of business.

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1. https://www.dawn.com/news/1394618
2. http://researcherslinks.com/current-issues/Resource-Poor-Farmers-and-Environmental-Degradation-in-Pakistan-How-Extension-Can-Help/24/1/1970/html
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